

REMARKS

Claims 1-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's Related Art FIGs. 2 and 3F in view of Kakuda et al. (US 5,162,933). Applicant respectfully traverses the rejection as being based upon Applicant's Related Art and a reference that neither teach nor suggest the novel combination of features recited by independent claim 1, and hence dependent claims 2-14.

The Office Action admits that Applicant's Related Art FIGs. 2 and 3F discloses all the features of claim 1, "except the metal layer formed on an entire surface of each of the data lines." Accordingly, the Office Action relies upon Kakuda et al. for allegedly showing "an LCD device having a data line 11b with a metal layer formed on the entire surface." In addition, the Office Action alleges that "[w]ith such a configuration, the materials of the data line provide a light blocking function, have good heat resistance, may lower the electrical resistance, and help simplify the manufacturing process because the data line can be formed simultaneously with the pixel electrode (col. 6, line 61 – col. 7, line 29)." Thus, the Office Action concludes that it would have been obvious to "modify the data line of the APAF by forming a metal layer on the entire data line as taught by Kakuda to provide a light blocking data line having good heat resistance, a specified electrical resistance, and a reduced manufacturing steps." Applicant respectfully disagrees.

Applicant respectfully asserts that Kakuda et al. is completely silent with regard to teaching that covering the ITO layer 11a with a molybdenum-base alloy layer 11b results in providing "a light blocking data line having good heat resistance, a specified electrical resistance, and a reduced manufacturing steps," as alleged by the Office Action. Moreover, Applicant respectfully asserts that the passage cited by the Office Action in Kakuda et al. is

wholly unrelated to covering the ITO layer 11a with a molybdenum-base alloy layer 11b.

Furthermore, in contrast to allegation made by the Office Action, Applicant respectfully asserts that Kakuda et al. fails to teach or suggest “the materials of the data line provide a light blocking function, have good heat resistance, may lower the electrical resistance, and help simplify the manufacturing process because the data line can be formed simultaneously with the pixel electrode (col. 6, line 61 – col. 7, line 29).”

First, Applicant respectfully asserts that Kakuda et al. actually teaches (col. 6, line 62-66) that the active matrix structure according to the disclosed invention of Kakuda et al. “permits a substantial reduction of the leakage currents which result from the irradiation of the thin film transistors by light and allows a substantially increase in the amount of charge which can be stored in the pixel capacitances.” Specifically, Applicant respectfully asserts that Kakuda et al. actually is referring to the benefits of the light blocking layer and storage capacitance electrode (col. 6, lines 4-12), wherein:

“[w]ith the active matrix structure described above, it is possible to effectively prevent deterioration of the display image quality, partly because the provision of the light blocking layer 18 affords substantial reduction of the leakage current which is caused by the incidence of light to the thin film transistor 20, and partly because the provision of the storage capacitance electrode 17 allows a substantial increase in the amount of charge to be stored in the pixel electrode 14.”

Thus, Applicant respectfully asserts that the alleged motivation provided by the Final Office Action, i.e., “the materials of the data line provide a light blocking function, have good heat resistance, may lower the electrical resistance,” is clearly not directed toward any structure associated with the data line structure 11 disclosed by Kakuda et al. In fact, the motivation alleged by the Final Office Action to be taught by Kakuda et al. is clearly directed toward

benefits of the light blocking layer and the storage capacitance electrode, and not to any data line structure disclosed by Kakuda et al.

Furthermore, Applicant respectfully asserts that the disclosure of Kakuda et al. (col. 6, line 61 – col. 7, line 29) relied upon by the Final Office Action is clearly directed toward benefits obtained from the light blocking layer, the storage capacitance electrode, and the storage capacitance lines. Specifically, Applicant respectfully asserts that Kakuda et al. explicitly discloses (col. 6, lines 12-17) that:

“[f]urthermore, since the light blocking layers 18, the storage capacitance electrodes 17 and the storage capacitance lines 29 are formed by the same layer of the same material, the number of manufacturing steps is minimized, and consequently, the manufacturing costs are low.”

Thus, Applicant respectfully asserts that the alleged motivation provided by the Final Office Action, i.e., “[w]ith such a configuration...help simplify the manufacturing process because the data line can be formed simultaneously with the pixel electrode,” is clearly not directed toward any structure associated with the data line structure 11 disclosed by Kakuda et al. In fact, the motivation alleged by the Final Office Action to be taught by Kakuda et al. is clearly directed toward benefits of the light blocking layer, the storage capacitance electrode, and the storage capacitance lines, and not to any data line structure disclosed by Kakuda et al.

Accordingly, Applicant respectfully asserts that the alleged motivation cited in the Final Office Action is wholly unrelated to features of the data lines of Kakuda et al. In other words, although Kakuda et al. may disclose benefits (col. 6, line 61 to col. 7, line 29) associated with an active matrix structure for a liquid crystal display device, Kakuda et al. is completely silent with regard to providing any motivation, either implicitly or explicitly, with which to modify the data

line structure shown in Applicant's Related Art FIGs. 1-3 in order to arrive at Applicant's claimed invention. Accordingly, Applicant respectfully asserts that the Final Office Action fails to establish a *prima facie* case of obviousness with regard to at least independent claim 1, and hence dependent claims 2-14, since the Final Office Action fails to cite any proper motivation with which to modify any of Applicant's Related Art FIGs. 1-3.

MPEP 2143.01 instructs that "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)." Accordingly, since Kakuda et al. fails to provide any proper motivation with which to modify any of Applicant's Related Art FIGs. 1-3, or suggest the desirability of combining the teachings of Kakuda et al. with any of Applicant's Related Art FIGs. 1-3, then the resultant combination is not obvious.

With regard to the Response to Arguments section of the Final Office Action, Applicant respectfully asserts that the comments set forth therein fail to successfully rebut Applicant's arguments regarding establishment of a *prima facie* case of obviousness with regard to at least independent claim 1, and hence dependent claims 2-14. Specifically, Applicant respectfully asserts that the disclosure relied upon by the Final Office Action fails to provide any proper motivation with which to modify any of Applicant's Related Art FIGs. 1-3.

First, the rebuttal offered by the Final Office Action that "[a]s stated in the rejection above, column 6, line 61 – column 7, line 29 disclose the motivation for forming the metal layer on the surface of the data lines" is clearly not supported by the disclosure of Kakuda et al. for at least Applicant's reasons set forth above. Accordingly, the rebuttal provided by the Final Office Action fails to successfully rebut Applicant's arguments that Kakuda et al. fails to provide proper

motivation with which to modify any of Applicant's Related Art FIGs. 1-3.

Second, the rebuttal offered by the Final Office Action that "[i]n column, 7 lines 8-29, Kakuda discloses the specific benefits of using metal materials such as aluminum or molybdenum as part of the data lines, gate lines, light blocking layers, etc." is incorrect. Kakuda et al. actually discloses (col. 7, lines 13-15) that "[a]luminum is particularly suited for the lines 11, 13 and 29 because it is low in electric resistance." In addition, Kakuda et al. continues to explicitly disclose (col. 7, line 66 to col. 8, line 5) the disadvantages of using an aluminum-molybdenum laminated films, i.e., formation of overhangs and differing etch rates. Accordingly, the rebuttal provided by the Final Office Action fails to successfully rebut Applicant's arguments that Kakuda et al. fails to provide proper motivation with which to modify any of Applicant's Related Art FIGs. 1-3.

Third, the rebuttal offered by the Final Office Action that "[a]pparently, molybdenum is suitable as a wiring material because of its heat resistance and its workability by chemical etching" fails to establish any proper motivation to modify any of Applicant's Related Art FIGs. 1-3. Specifically, Applicant respectfully asserts that Kakuda et al. explicitly discloses (col. 7, lines 20-22) that molybdenum is "appreciably higher in its electric resistance than aluminum (Al)." Although Kakuda et al. may disclose that molybdenum is widely employed as a material for electrodes, Kakuda et al. also discloses (col. 7, lines 35-43) that both open-circuit and short-circuit conditions are caused by its use as a material with which to form conductive lines. In fact, Kakuda et al. lists a number of disadvantages of using molybdenum as a material with which to form conductive lines. Accordingly, the statement provided by the Final Office Action fails to successfully rebut Applicant's arguments that Kakuda et al. fails to provide proper motivation with which to modify any of Applicant's Related Art FIGs. 1-3.

Fourth, the rebuttal offered by the Final Office Action that “[i]n column, 7, lines 44-67, Kakuda discloses the known practice of forming laminated matrix lines of ITO and metal in an active matrix LCD device to reduce the resistance of lines” is completely taken out of context with regard to the entire disclosure of Kakuda et al. Specifically, Applicant respectfully asserts that Kakuda et al. explicitly discloses that:

“...in an active matrix LCD (liquid crystal display), it is desirable, for the purpose of reducing the resistance of matrix lines, to employ a laminated structure in which an aluminum film overlies the ITO film forming the transparent electrode, *but direct lamination of the ITO and aluminum (Al) films poses a problem as the ITO is corroded by preferential dissolution resulting from galvanic action between the dissimilar metals.*”

Furthermore, Kakuda et al. discloses (col. 7, lines 51-59) the different failures associated with using aluminum-molybdenum laminated films. Accordingly, Applicant respectfully asserts that Kakuda et al. actually discloses the disadvantages of using the known practice of forming laminated conductive lines in LCD devices. Thus, the rebuttal provided by the Final Office Action fails to successfully rebut Applicant’s arguments that Kakuda et al. fails to provide proper motivation with which to modify any of Applicant’s Related Art FIGs. 1-3.

Fifth, the rebuttal offered by the Final Office Action that “[a]lthough col. 6, line 61 – col. 7, line 7 specifically discloses the invention’s benefits as they pertain to the active matrix as a whole, the benefits still pertain to the data line portion as well because the data line is a part of the LCD active matrix” is incorrect. Applicant respectfully asserts that the explicit disclosure of Kakuda et al. at col. 6, line 61 to col. 7, line 7 specifically points out the disadvantages of using aluminum-molybdenum laminated conductive lines in AM-LCD devices. As such, the Final Office Action’s conclusion that “benefits” disclosed by Kakuda et al. (col. 6, line 61 to col. 7,

line 7) are, at best, contradictory to the explicit disclosure of Kakuda et al. For example, the Final Office Action maintains that “benefits” are disclosed by Kakuda et al. at col. 6, line 61 to col. 7, line 7, but the actual language of Kakuda et al. is all directed toward the negative results from using laminated films for AM-LCD device. Thus, the rebuttal provided by the Final Office Action fails to successfully rebut Applicant’s arguments that Kakuda et al. fails to provide proper motivation with which to modify any of Applicant’s Related Art FIGs. 1-3.

Sixth, the rebuttal offered by the Final Office Action that “[t]he lines that have been recited in this argument show specific benefits for the use of a metal layer on the data lines and this shows proper motivation for combining with the APAF” is completely unsupported by the cited portions of Kakuda et al. of the reasoning set forth in the Final Office Action. Applicant respectfully asserts that the Final Office Action has failed to cite any portions of Kakuda et al. that properly provide any motivation whatsoever with which to combine the teachings of Kakuda et al. and any of Applicant’s Related Art FIGs. 1-3. In fact, the Final Office Action repeatedly attempts to redefine the disclosure (col. 6, line 61 to col. 7, line 29) of Kakuda et al. as explaining the “benefits” of using a laminated conductive line structure, whereas Kakuda et al. continuously discloses the disadvantages of using a laminated conductive line structure, i.e., breakage of wires and shorting of the wires. Thus, the rebuttal provided by the Final Office Action fails to successfully rebut Applicant’s arguments that Kakuda et al. fails to provide proper motivation with which to modify any of Applicant’s Related Art FIGs. 1-3.

For at least the above reasons, Applicant respectfully submits that claims 1-14 are neither taught nor suggested by Applicant’s Related Art FIGs. 2 and 3F and Kakuda et al., whether taken alone or in combination. Thus, Applicant respectfully asserts that the rejection

under 35 U.S.C. § 103(a) should be withdrawn because the above-discussed novel combination of features are neither taught nor suggested by Applicant's Related Art FIGs. and the applied reference.

CONCLUSION

In view of the foregoing, Applicant respectfully requests reconsideration and timely allowance of the pending claims. Should the Examiner believe that there are any issues outstanding after consideration of this Response, the Examiner is invited to contact Applicant's undersigned representative to expedite prosecution.

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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